

WHAT IS CLAIMED IS:

1. A light reception/emission device built-in module with optical and electrical wiring combined therein, comprising:

5 an optical waveguide layer comprising a core portion and a cladding portion;

first and second wiring patterns formed on at least one of main surfaces of the optical waveguide layer;

10 a light reception device disposed inside the optical waveguide layer, the light reception device being optically connected with the core portion of the optical waveguide layer and being electrically connected with the first wiring pattern; and

15 a light emission device disposed inside the optical waveguide layer, the light emission device being optically connected with the core portion of the optical waveguide layer and being electrically connected with the second wiring pattern.

2. The module according to claim 1, wherein the light reception device and the light emission device are disposed in the optical waveguide layer so that optical input and output are conducted in a direction parallel to a plane on which the core portion of the optical waveguide layer is formed.

3. The module according to claim 1, wherein the light emission device is configured with a surface emission type laser.

4. The module according to claim 1, wherein an end face of the core portion of the optical waveguide layer is optically connected with the light reception device and the light emission device via a light-transmitting resin material.

5. The module according to claim 1, wherein a third wiring pattern is formed on the other main surface of the optical waveguide layer.

6. The module according to claim 5, wherein a circuit component is packaged on the third wiring pattern.

7. The module according to claim 1, further comprising an insulation

board made of a mixture containing an inorganic filler and a thermosetting resin on at least one side of the optical waveguide layer.

8. The module according to claim 1, comprising a plurality of the core portions.

9. The module according to claim 8, wherein at least two core portions of the plurality of core portions are disposed on a same plane.

10. The module according to claim 8, wherein at least three end faces of end faces of the plurality of core portions are disposed on a same plane.

11. The module according to claim 8, wherein at least three end faces of end faces of the plurality of core portions are disposed on a substantially same line.

12. The module according to claim 1, comprising a plurality of the optical waveguide layers.

13. The module according to claim 12, wherein end faces of core portions of the plurality of optical waveguide layers have a concave form or a convex form.

14. The module according to claim 1, wherein the light reception device, the light emission device and the optical waveguide layer are all embedded in an electrical insulation layer.

15. A method for producing a light reception/emission device built-in module with optical and electrical wiring combined therein, comprising the steps of:

forming a through hole in an optical waveguide layer comprising a core portion and a cladding portion;

forming a plurality of wiring patterns on a main surface of a releasing film and packaging a light reception device and a light emission device on the wiring patterns;

aligning the releasing film so that the wiring patterns face a side of the optical waveguide layer and overlaying the same on the optical

waveguide layer, followed by application of pressure, so that the light reception device or the light emission device is disposed in the through hole in the optical waveguide layer;

filling the through hole with a resin that is transparent with respect
5 to light propagating through the core portion; and
curing the resin.

16. An assembled member including a light reception/emission device
built-in module with optical and electrical wiring combined therein,
10 comprising:

an optical waveguide layer comprising a core portion and a cladding
portion;

first and second wiring patterns formed on at least one of main
surfaces of the optical waveguide layer;

15 a light reception device disposed inside the optical waveguide layer,
the light reception device being optically connected with the core portion of
the optical waveguide layer and being electrically connected with the first
wiring pattern;

a light emission device disposed inside the optical waveguide layer,
20 the light emission device being optically connected with the core portion of
the optical waveguide layer and being electrically connected with the second
wiring pattern; and

a driving device and an amplification device that are packaged on
the optical waveguide layer,

25 wherein the light emission device is electrically connected with the
driving device via the second wiring pattern and the light reception device is
electrically connected with the amplification device via the first wiring
pattern.

30 17. The assembled member including a module according to claim 16,
wherein an anode terminal and a cathode terminal of the light emission
device are both electrically connected with the driving device via the second
wiring pattern and an anode terminal and a cathode terminal of the light
reception device are both electrically connected with the amplification device
35 via the first wiring pattern.